Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

Potato Gene Resources

Number 14 – 2007

Let Them Eat Potatoes!

Paul Stapleton
Head of Communications and Public Awareness, International Potato Center, Lima, Peru

Potatoes are easy to take for granted, but in fact they are the most important tuber crop in the world. Today, hundreds of millions of people in the developing world depend on potatoes for their survival.

In the next two decades, the world's population will grow by more than a hundred million people a year. Most of this growth will come in the developing countries, where the pressures on earth, water and other natural resources are already intense. Yet this future population will need new sources of food. Potatoes can play a major role in feeding the future population.

Andean farmers plant a wide range of varieties in one field to ensure a harvest, no matter the climatic conditions.

Today, more than 130 countries grow potatoes and over a billion people worldwide eat them. Canada is the world's12th largest potato grower, with 2006 output of almost five million tonnes. The potato accounts for one third of all its vegetable farm cash receipts, making it Canada's most important horticultural crop.

Canadians eat just over 85 kg of potatoes per person each year, although the people of Belarus are the world champion potato eaters, eating 171.2 kg each per year. But the truth is that the potato is feeding more and more people in the developing nations, as their need for food increases with expanding populations.

China is currently the world's biggest producer of potatoes, growing over 70 million tonnes per year. Almost 213 million tonnes of potato are grown to eat every year, making it the third most important food crop in the world after rice and wheat. More than half of the global potato output comes from developing countries. Since the early 1960s, it has outstripped all other food crops in the developing countries in terms of growth in production area, and this trend is expected to continue.

Because of the importance of the potato, the United Nations (UN) named 2008 as the International Year of the Potato (IYP). The Government of Peru was responsible for

nominating 2008 to the United Nations as the IYP. The UN Resolution notes that the potato is a staple food in the diet of the world's population. It affirms the need to focus world attention on the role that the potato can play in providing food security and eradicating poverty in support of achieving internationally agreed development goals, including the Millennium Development Goals.

Potatoes are a major source of calories for Andean people.

Needless to say, the International Potato Center, known by its Spanish acronym CIP, will be taking advantage of this opportunity to further the cause of the potato.

CIP will be working with the UN, in this case the Food and Agriculture Organization (FAO), to co-sponsor a 4-day workshop in March 2008 in Cuzco, Peru (http://www.cipotato.org/Cuzco_conference/). This meeting will bring together leaders in the potato and research-for-development communities to advance discussions on how to understand potato science for the poor in today's developing world and to enhance the impact of potato science in increasing productivity, profitability and sustainability of potato-based systems across the developing world.

The biodiversity of Andean potatoes.

In the regions, CIP will be working to intensify its existing research base on potato, conserving genetic resources, breeding for pest and disease resistance, and increasing yields and productivity. In particular, CIP will be working closely with its collaborating institutions and donors to highlight the importance of the contribution that the potato can make to poverty alleviation, food security and human health. CIP already has a long and fruitful collaboration with the Canadian government. For example with the support of CIDA, CIP is implementing a 5-year, C$10 million project to improve Andean agriculture in the Altiplano, a high-altitude plain between Peru and Bolivia.

Andean farmers have formed a Potato Park just outside Cuzco, Peru, to conserve *in situ* their wild potato varieties. Here two of them are sorting out potato varieties according to color and shape.

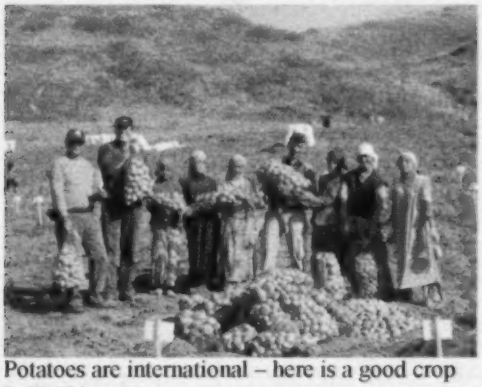
On the more popular side, the Center is working with international collaborators to develop a major exhibition entitled "The Progress of the Potato", which will illustrate the way that the potato came to Europe, was finally accepted as a food and then spread across the globe to become the third most important food crop in the world. The exhibition will be seen in 11 countries in Europe and Scandinavia, and its content will also be available on CIP's website (www.cipotato.org) in 2008.

The humble potato holds enormous promise to contribute to meeting the needs of the

developing world. In fact, the adjective "humble" is a complete misnomer. Picking up a bag of potatoes in the supermarket puts you directly in touch with a treasure trove of history. The potato did not come from Idaho, Ireland or Germany. The origin of today's potato stretches back 8000 years, past 16th century scholars, Spanish conquistadors, the Inca civilization and pre-Colombian cultures to the shores of Lake Titicaca high up in the Andes.

Potatoes were first grown by settlers in New Brunswick, on Canada's Atlantic coast, as early as the mid-1600s. Because of the tremendous biodiversity of the potato, over 5000 varieties exist, they are ideally suited to places where land is limited and labor is abundant, conditions found in much of the developing world. What's more, the potato yields more nutritious food more quickly on less land and in harsher climates than any other major crop. Potatoes produce more food per unit of water than any other major crop. Potatoes are also an excellent source of complex carbohydrates.

For poor potato farmers in developing countries, improving yields is essential to their ability to achieve economic independence and food security. While average potato yields in Canada are about 32 tonnes per hectare, yields in developing countries are usually below 20 tonnes per hectare—a persistent and sizable yield gap. Reducing this gap is one of CIP's priorities.



Potatoes are international – here is a good crop in Tajikistan.

The potato has come a long way since it was blamed for causing everything from lust to leprosy. Let us hope that the International Year of the Potato will give us an opportunity to dispel many of the misconceptions that still surround the crop. Far from being fattening, a medium-size potato boiled with the skin on provides about 100 calories, 26 grams of carbohydrates, zero cholesterol, about 4 grams of protein, 3 grams of fiber, about half the daily adult requirement of vitamin C, as well as significant amounts of iron, potassium, zinc, thiamin, niacin and vitamin B_6. This healthy tuber will increasingly play a vital role in alleviating hunger and improving the livelihoods and health of different populations around the world.

All images © International Potato Center (CIP).

Pomme de Parterre: The Potato Speaks for Itself

Rebecca Duclos[1] and Angela Iarocci[2]
[1]Adjunct Associate Professor, Maine College of Art, Montreal, Quebec/Portland, Maine
[2]moimoi Design, Toronto, ON

Inspired by grade school science experiments and the embrace of vernacular agricultural practice, *Pomme de parterre* transforms the ornamental structure of the garden parterre into an off-grid potato power plant that generates its own sonic signal. Drawing on Leo Marx's concept of "the machine in the garden", *Pomme de parterre* is a landscape architecture project that examines the potential for a symbiotic relationship between technology and the environment. For designers Angela Iarocci, Claire Ironside, and David Ross, the "machine" in question is the potato. A starchy archive of cultural and historical significance to Canada and the world, the potato is also a motherlode of stored energy that can be converted into sound.

Pomme de parterre is one of several commissioned projects for the 8th edition of the International Garden Festival. Every year, the festival presents temporary gardens created by Québec, other Canadian, and international designers on a site adjacent to the historic Reford gardens. The 2007 festival (June 23 to September 30) features four new gardens that specifically explore sound as an under-appreciated aspect of our experience of landscape.

Pomme de parterre consists of two distinct but interrelated components: a formal parterre garden divided into 16 sections, planted with 13 different heirloom potato varieties; and a wooden storage chamber that houses a 1000-potato battery producing a symphonic expression of the potato's embedded energy.

Heirloom potatoes

The potatoes planted in the parterre were provided by Seeds of Diversity vice-president, Garrett Pittenger, who lent his considerable expertise and enthusiasm to the project. Garrett provided all 13 of the heirloom varieties — Ailes Roses, Bauer Gruen's Rote Auge, Bintje, Corne du Mouton, Crotte d'Ours, Elmer's Blue, Kifeler, Matsuyama, Mrs. Moehrle's Yellow Flesh, Norland, Papa Negra, Rode Ersteling and Siberian.

We chose these varieties to show the incredible diversity of the potato in terms of place of origin, colour of skin and flesh, size, plant characteristics and, once harvested, flavour. Jane Percy of the Potato Gene Resources Repository at Agriculture and Agri-Food Canada was also instrumental in providing the information about the varieties that helped the designers make a final selection.

In addition to the potato plants, orange dwarf marigolds border the plots to add a shot of colour and deter potato-infesting insects. Nasturtiums frame the stairwells filling in the areas below the deep eaves of the storage shed.

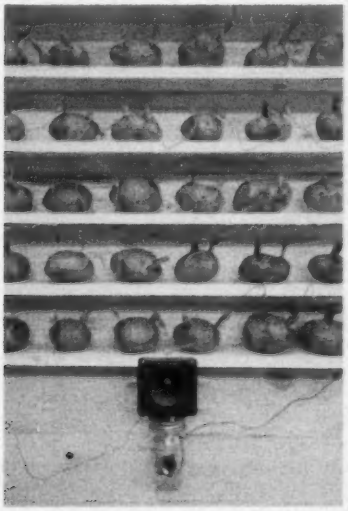
As the different varieties grow side by side in the parterre, the visitor is treated to a direct visual comparison of the plants and can immediately appreciate that the potato is more than just a plain old tuber. The heirloom potatoes will be harvested at the end of September when the festival closes but will continue to live on in the kitchen garden of the Jardins de Métis restaurant. Some of the potatoes will also be stored over the winter to be planted next spring for the second year of the *Pomme de parterre* installation.

Potato battery

The other main component of the project is a partially buried, publicly accessible storage chamber in the centre of the garden. The interior of the shed is fitted with 156 shelves supporting over 1000 locally grown potatoes. (This number represents the annual

potato consumption for an average Canadian family.) Russet and white potatoes used for the battery were provided by grower J.L. Drapeau in Ste-Flavie, Québec.

The shelves are sectioned into 12 distinct batteries of 104 potatoes each and are relay-wired to copper and galvanized steel electrodes embedded in the potatoes. The generated current, strengthened by connecting the potatoes in series and then in parallel, is passed through a circuit board and speaker system custom designed by Montreal Artist, Peter Flemming. The electricity generated is converted into sounds of variable pitch, duration and frequency, resulting in a 12-part intermittent chorus of electronic tones that surrounds the visitors as they stand inside the living battery.



The typical visitor's reaction upon entering the storage shed is first of disbelief that the sounds are indeed coming from the potatoes and then of delight and amazement.

The design and construction of the storage chamber is inspired by the wooden crates used to ship potatoes to market. The building foundation is constructed of buried transport boxes filled with soil. A knee wall and ventilated roof sit on top of this foundation to create a chamber that is four feet below grade with an additional three feet of height visible above ground. The submerged cellar design works both as a resonating chamber and cool summer storage for the tubers. This building typology also references the local vernacular of the partially buried field sheds common throughout the Métis region. Access to the chamber is via a long gravel path that begins from the outer edge of the site and ends with a set of stairs leading down into the chamber. Once inside, the participant who views and listens to the potatoes is at eye level with both the potato battery and with the potatoes planted in the soil around them.

There are two quiet innovations that *Pomme de parterre* puts forth. First, the project synthesizes "old" technologies of terrestrial cold storage (the sunken earth shed) with "new" technologies of energy harvest (the battery). These two seemingly incongruous procedures — the first concerned to maintain dormancy and stasis, the other focused on the dynamic extraction of energy — are brought together around the humble potato. The spud's starchy flesh is preserved over the summer (kept dormant) so that it can be penetrated by zinc and copper electrodes and wired for sound (made active). The parterre plays upon the absurdity of seeing such aggressive technologies of transduction applied to the otherwise silent potato. The result is a storage shed made strange: What should be a simple root cellar becomes a hidden laboratory of sonic experimentation.

Second, *Pomme de parterre* makes connections between the storage and release of invisible substances, such as calories, electricity, sound, temperature and "life force". In highlighting the harvested potato's capacity to act simultaneously as a nutritional, electrical, and sonic energy source, the project concentrates on creating simple traces of activity that can be experientially sensed and physically witnessed. The semi-subterranean storage chamber creates an authentic, immersive environment into which visitors descend to stand "inside" the growing parterres of potatoes as they are surrounded by the waning batteries of harvested vegetables. These interior and exterior "fields" of potatoes thus come to maturity in a complementary fashion. While the potatoes inside the shed expend their collected energy and begin to die, the potato plants outside the chamber continue to absorb energy from the sun and soil to grow more robust. These normally silent cycles of decay and growth — energy out and energy in — are given an unexpected "voice" in *Pomme de parterre*.

The designers thank Garrett Pittenger and Jane Percy for their time and expertise for this project as well as Professor Ted Kesik of the Faculty of Architecture, Landscape and Design at the University of Toronto and Peter Flemming, Montreal Artist, for his design and construction of the battery components.

You can see and hear the project at www.pommedeparterre.net and visit the International Garden Festival at www.jardinsmetis.com.

This article was originally published in the Seeds of Diversity Canada Magazine No. 20.3, Autumn 2007.

Spotlight on Potatoes at the 2007 Royal Agricultural Winter Fair

Jane Percy
Potato Gene Resources Repository
Agriculture and Agri-Food Canada
Potato Research Centre, Fredericton, NB

The wide-ranging diversity of the potato and the work of the Potato Gene Resources Repository was the focus of one part of the Agriculture and Agri-Food Canada (AAFC) exhibit at the Royal Agricultural Winter Fair, held in Toronto in early November.

School children, university students and seniors were among those delighted and amazed to see purple fleshed "Congo"; the fingerling variety "Kifli"; and "Garnet Chili", the venerable parent of many of our modern potato varieties.

School children were interested in the potato display.

These potatoes, as well as eight other varieties presented as fresh tubers, were chosen to showcase the amazing range of skin and flesh colour, shape and size, uses, and historical origins. Many people

commented that they did not realize there were so many different types of potatoes and expressed an interest in trying unusual types in the future. One special visitor to the exhibit was The Honourable Gerry Ritz, Minister of Agriculture and Agri-Food.

The Royal presented an excellent opportunity to speak to a large urban audience about the work of AAFC's research programs in biodiversity, and the importance of the national system of gene banks, which are coordinated by Plant Gene Resources of Canada located in Saskatoon. Visitors were very pleased that Canada is safeguarding biodiversity through the gene bank programs. There were many positive remarks about the importance to Canada of biodiversity and its preservation.

Some prize-winning potato entries.

In vitro potato plants from Fredericton's Potato Gene Resources Repository (PGR) were also featured in the display. They provided an insight into unique aspects of conservation for a clonally propagated crop such as potato. The *in vitro* plants also elicited many questions about tissue culture techniques and procedures used at the Repository.

Readers may be interested to know that a handout entitled "Not Just Your Ordinary Potato" which outlined the work of the Repository and provided a brief description of each variety on display was available. Several of the showcased varieties came into the Repository through the expertise and advice of Seeds of Diversity Canada (SoDC) members including Garrett Pittenger, Angelina Mahoney, Heather Apple, Louis-Marie Ouellette, Antoine D'Avignon, Marc Warshaw and Alex Caron among others.

Ryerson journalism students view the Potato Gene Resources Display.

The handout referenced this and those who inquired about the origins of the heirloom material were pleased to hear of the long standing beneficial relationship between the Repository and SoDC. Retired potato breeder Henry DeJong, who has researched and written articles on heirloom potato varieties which have been published in both the SoDC and PGR newsletters, visited the exhibit.

Modern potato varieties on display were AC Red Island, bred by Ken Proudfoot for the Newfoundland fresh market; the outstanding french fry variety Shepody; and Rochdale Gold-Dorée, licensed in 2005 exclusively to Co-op Atlantic and named for the Rochdale pioneers who created the first retail co-operative society in 1844.

Purple and red potato chips from AAFC's Potato Breeding Program at the Potato Research Centre, Fredericton, NB, demonstrated the antioxidant-rich advanced selections which are being evaluated. A handout entitled "Potatoes with Coloured Flesh May Promote Health" was available for those who wished to read more about the Centre's research program.

Potatoes were just one of several parts of the AAFC exhibit. Also highlighted were Insect Biodiversity and a display of the work of the Canadian National Collection of Insects, Arachnids and Nematodes (CNC); Pear Breeding and Biodiversity, including the opportunity to taste and vote on the name of a new pear selection from the AAFC research sites at Harrow and Vineland; and Biofuels, represented by a tractor specially equipped to measure many operational parameters, as well as samples of the various biodiesel fuels being tested. Also featured at the exhibit was the visit of Canadian Astronaut Robert Thirsk. Canasnacks, the bite-sized oatmeal sandwich cookies that were specially designed for astronauts during space travel were available for sampling. Canasnacks are a product of collaborative research between the Canadian Space Agency and an AAFC food nutrition research team led by Ted Farnworth at the Food Research and Development Research Centre, Saint-Hyacinthe, QC. They feature Canadian ingredients such as maple sugar, cranberries, blueberries, canola oil and oats.

The Potato Gene Resources Repository display at the 2007 Royal Agricultural Winter Fair was well received. The excellent assistance of the AAFC Communications and Exhibits teams in Ottawa, in partnership with the Potato Breeding program at Fredericton, contributed to this success.

Potatoes at the Royal Agricultural Winter Fair

The Potato and Glycoalkaloids

Richard Tarn
Curator, Potato Gene Resources Repository,
Potato Research Centre, Fredericton, NB

As a staple food, the potato has many constituents. Everyone is aware of the starch, proteins, minerals and vitamins and of course the 80% water. The potato also has many minor constituents and one of these is glycoalkaloids – naturally occurring nitrogen containing organic compounds. They are generally present at very low levels in potato tubers and are considered to contribute to the flavour of the potato. At higher levels the glycoalkaloids are bitter tasting, and produce a burning irritation in the back of the mouth and side of the tongue. In other parts of the potato plant, including leaves, sprouts and unripe berries, glycoalkaoids occur at very high levels and are considered to confer a degree of protection against various diseases and pests.

Ingested in large amounts glycoalkaloids can cause nausea or worse. For this reason, and for safe consumption, Health Canada has established an upper limit of 20 mg of glycoalkaloid per 100 g fresh weight of potato tuber. All new cultivars are required to have tuber glycoalkaloid levels below this threshold before they can be registered for commercial production.

Tuber glycoalkaloid content is being assessed as part of the on-going evaluation of accessions in the Potato Gene Resources Repository and a number of entries have been identified with levels in excess of the acceptable threshold. These accessions are identified on our list of available material.

Glycoalkaloid levels above the Health Canada threshold have been found in the heirloom varieties Crotte d'Ours and Haida, that have never been tested previously, and in an old Canadian variety, York, released before the threshold was established and no

longer in commercial production. An old US breeding line USDA 41956 and the cultivar Lenape, withdrawn from commercial production, also have levels that exceed the threshold. The testing of glycoalkaloid content will continue until all accessions have been tested.

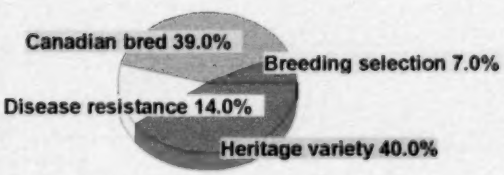
Annual Report 2007

Jane Percy
Potato Gene Resources Repository

The Collection

1. Holdings

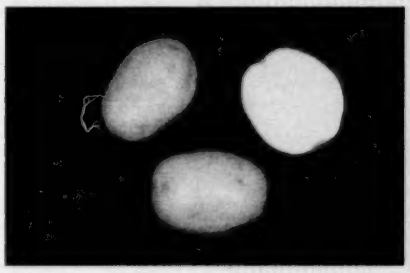
The Potato Gene Resources Repository contains 139 clones. Of this total, 129 are maintained *in vitro* and 10 as tubers. A full listing of accessions may be found on the attached request form. The following chart shows the percentage of clones in each Repository category.



2. Accessions

Seven *in vitro* clones were added to the Repository in 2007. The new accessions include AC Ouelle, AC Pocat, All Red, Cherokee, German Butterball, Irish Cobbler and Purple Viking. The latter five were obtained as part of the MII agreement with Seeds of Diversity Canada and Plant Gene Resources of Canada.

AC Sunbury, Libertas and Up-To-Date were placed *in vitro* in 2007.



Tubers of AC Sunbury.

No accessions were lost from the inventory in 2007.

3. Evaluations

Several PGR clients send yearly reports of yield, cooking quality and disease reactions in their particular regions of North America. Betty Keeler, Vanscoy, SK, called to provide details of the PGR varieties grown in 2007.

Twenty varieties were grown in an evaluation trial at the Potato Research Centre. Two replications of fifteen hills of the following varieties: Abnaki, Banana, Black Mignion/The Cups, Cain's Irish Rocks, Cariboo, Columbia Russet, Cherokee, Earlaine, Fundy, Grand Falls, Green Mountain, Haida, Hindenburg, Hunter, Huron, Keswick, La Veine Rose/La Belle Rose, Marc Warshaw's Quebec, Nipigon and York were grown. Superior and Chieftain were grown as checks. The tubers and tuber light sprouts were photographed by Cynthia Murray. As well, chemical analysis for levels of total glycoalkloids (TGA) was performed by Jean Embleton and Leslie Read.

Harvest of Potato Gene Resources Plot at the Potato Research Centre, Fredericton, NB.

The variety Urgenta was tested for resistance to wart in Newfoundland by Steve Wood, CFIA.

Twenty-four clones were grown in 20 hill plots at the Benton Ridge Potato Breeding Substation, Benton, NB, to provide material for demonstration and cooking quality throughout the winter and spring.

Newly harvested tubers of the variety La Veine Rose.

4. Management

Passport data for all PGR accessions has been added to the Genetic Resources Information Network - Canadian Version (GRIN - CA). GRIN - CA may be accessed through the Plant Gene Resources of Canada web site http://pgrc3.agr.ca/.

Disease testing of new *in vitro* accessions and clones which have been maintained *in vitro* for five years was completed. Twenty-nine clones were grown in the greenhouse and tested twice in 2007. All clones were negative for PVA, PLRV, PotLV, PVS, PVX and PVY. Results for PSTV and BRR are pending. Extra minitubers from the greenhouse growout will be offered to PGR clients in the spring of 2008.

In vitro clones were screened for bacterial and fungal contamination using Potato Dextrose Broth and Richardson's Broth, twice during 2007. All clones currently in the Repository were negative for these contaminants.

Production and harvest of microtubers of 122 in vitro accessions was completed in June 2007. In total, 2239 microtubers were aseptically harvested, placed in petri dishes and sent to Plant Gene Resources of Saskatoon for storage at 4°C. The viability of the Repository is protected by this remote location, long-term storage arrangement. Dallas Kessler of Plant Gene Resources Canada has kindly offered to monitor and evaluate the microtubers during storage. This will allow us to identify when new microtubers should be initiated to replace them.

Work continues on a proposal to create a specialized laboratory and growth room, at the Potato Research Centre, for the work of the Repository. Such a unit would address phytosanitary and security concerns, in accordance with international standards for genebanks.

5. Requests to the Repository

Forty-nine requests for 552 clones were received in 2007. Of this number, 210 clones were *in vitro*, 150 clones were field grown tubers and 70 clones were greenhouse grown minitubers. Microtubers were produced for 122 clones, harvested and sent to Plant Gene Resources Canada, Saskatoon, SK for long-term, off-site storage. The intended use of potato clones distributed in 2007 is tabulated below.

Purpose of request	Request	Clones	*In vitro*	Tubers	Mini-tubers	Micro-tubers
Breeding	5	27	15	6	6	-
Research	9	121	104	10	7	-
Demonstration	11	136	58	74	4	-
Evaluation	19	125	23	57	45	-
Preservation	4	139	6	3	8	122
Certification	1	4	4	-	-	-
Total	49	552	210	150	70	122

Five-Year Compilaton of Clone Distribution for Potato Gene Resources 2003-2007

Year	Total	Breeding, research or certification requests	Heritage evaluation, demo or preservation requests	Total clones distributed	Clones distributed as minitubers & tubers	Clones distributed *in vitro*	Microtubers distributed
2003	29	12	17	232	171	61	0
2004	39	20	19	496	405	91	0
2005	54	18	36	654	364	183	107
2006	45	12	33	511	297	214	0
2007	49	15	34	552	220	210	122
5 year total	216	77	139	2445	1457	759	229

•Congo and Marc Warshaw's Quebec were the most requested clones in 2007.

Number of Requests by Destination

Destination	Number of Requests
Newfoundland and Labrador	2
Prince Edward Island	4
Nova Scotia	3
New Brunswick	16
Quebec	8
Ontario	7
Saskatchewan	2
Alberta	3
British Columbia	1
USA	3
Total	49

Repository Items of Interest

Communication

Requests for information about the Repository, the availability of clones, clone descriptions and pedigrees and techniques for handling *in vitro* material were received throughout the year.

The annual Potato Gene Resources newsletter has a distribution of 250.

The 2006 newsletter and several back issues may be accessed on the Weekly Checklist of Government of Canada Publications. Browse for the newsletter by title at http://publications.gc.ca/control/weeklyChecklistMain?searchAction=4&searchAction=13&productId=1

An article on the Repository was prepared by Mary Kay Sonier for the Prince Edward Island Potato News.

An article entitled "Canada's Potato Gene Repository", by Jane Seabrook and Jane Percy, was published in the Winter 2006 No19.1, Seeds of Diversity Canada magazine.

La semaine verte, article "Pomme de terre aux antioxydants élevés" including a video clip is now available at: http://www.radio-canada.ca/actualite/semaineverte/ColorSection/agriculture/040425/patates.shtml

The article entitled "Acquisitions de variétés anciennes", by Jane Percy, was reprinted in the Seeds of Diversity Canada magazine, No. 20.2, spring 2007.

Dr Richard Tarn was interviewed by Marjorie Mason, host of the radio show "Let's Get Growing", from Oshawa, Ontario, in November 2007. Topics included heritage potato varieties in the Repository and new releases of the potato breeding program.

An article entitled "Spotlight on Potatoes at the 2007 Royal Winter Fair", by Jane Percy, was published in the Seeds of Diversity Canada magazine, No. 21.1, Winter 2008.

An article entitled "Carlton Potato", by Jim Ternier, was published in the Seeds of Diversity Canada magazine, No. 21.1, Winter 2008. Carlton is a variety in the Repository.

Publications prepared for the Potato Gene Resources Repository display at the 2007 Royal Agricultural Winter Fair, Toronto, included a poster and handouts entitled "Not Just Your Ordinary Potato.../Pas juste une vulgarie patate..." ; "Potatoes with coloured flesh may promote health/Les pommes de terre à chair colorée pourraient être bonnes pour la santé"; "Plants That Changed the World Potato/La pomme de terre une plant qui a changé le monde." The AAFC Communications and Exhibits teams in Ottawa, the potato breeding program at Fredericton and Dr. Jane Seabrook contributed to these publications.

Photos of many of the accessions in the Repository are now available to view on the GRIN-CA site. Search on clone names at http://pgrc3.agr.ca/acc/search-recherche_e.html .

Many thanks to Eugene Timmermans, Plant Gene Resources of Canada for making this possible.

Displays

Potato Gene Resources clones were displayed during the 10th Potato Selection Release Open House held in February to promote new selections to industry. The cooking quality of heritage varieties was highlighted in the display. *In vitro* potato plants as well as minitubers and field tubers were displayed. Potato Gene Resources Repository newsletters with request forms and a handout describing the individual clones were also available.

The Benton Ridge Potato Breeding Substation held an Open House in July 2007. Potato Gene Resources Clones and literature was on display.

Potato Gene Resources has a new permanent display in the front lobby of the Potato Research Centre, Fredericton, NB. The PGR display, part of the new lobby installation, includes a description of the work of the Repository and 20 test tubes with replica *in vitro* potato plants.

Potato Gene Resources provided background information on heritage potato varieties to Angela Iarocci, Claire Ironside and David Ross, designers of the "Pomme de Parterre: The Potato Speaks for Itself", a landscape architecture project at the 2007 International Garden Festival, Jardins de Métis, Grand-Métis, Québec.

The Repository was part of an AAFC and Government of Canada display at the Royal Agricultural Fair held in Toronto from November 2-11, 2007. The Canadian National Collection of Insects, Arachnids and Nematodes (CNC), pear breeding, biodiversity; and biofuels, were also featured.

Potato Gene Resources Newsletter

The Potato Gene Resources Newsletter is an annual publication of the Potato Gene Resources Repository, Potato Research Centre, Agriculture and Agri-Food Canada. The Newsletter provides information on potato germplasm in the Repository and on issues related to the genetic diversity in the potato. The opinions expressed by authors may not necessarily represent the views of Agriculture and Agri-Food Canada.

Le Bulletin est également disponible en français. To receive the newsletter, please contact:
Jane Percy, Editor, Potato Gene Resources Newsletter Potato Research Centre
Agriculture and Agri-Food Canada
P.O. Box 20280, Fredericton, N.B.
Canada E3B 4Z7
Tel: 506-452-3160
Fax: 506-452-3316
Email: percyj@agr.gc.ca
Website: http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1180622499704&lang=e
ISSN 1496-497X

The Repository and the Seed Potato System

Richard Tarn
Curator
Potato Gene Resources Repository
Agriculture and Agri-Food Canada
Potato Research Centre

The Potato Gene Resources Repository provides *in vitro* plantlets and greenhouse or field tubers for breeding, research and heritage preservation. While extensively tested for freedom from disease, the plantlets and tubers distributed by the Potato Gene Resources Repository are produced outside the Canadian Seed Certification System and are not eligible for Certification.

The Canadian Seed Potato Certification System operates under the Seed Act and its Regulations. Certification begins with tested plantlets established *in vitro* in a facility accredited for this task by the Canadian Food Inspection Agency. The plantlets are used to produce greenhouse tubers which then go to the field in a limited generation system, at each step meeting strict standards specified in the Regulations. The Potato Gene Resources Repository is not accredited for seed production by the CFIA.

Potato Research Centre Website

http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1180622499704&lang=e offers an overview of the mandate, resources and achievements of the Centre. The research studies being conducted at the Centre as well as the staff associated with those studies are highlighted. Links to the Potato Research Network and to other agriculture and potato related websites are also available.

Plant Gene Resources of Canada

Canada's Plant Germplasm System is a network of Centres and people dedicated to preserving the genetic diversity of crop plants, their wild relatives and plants present and unique in the Canadian biodiversity. The system plays a significant part of Agriculture and Agri-Food Canada's commitment to the Canadian Biodiversity Strategy in response to the Convention on Biological Diversity.

The Plant Gene Resources of Canada (PGRC) website located at http://pgrc3.agr.ca/ includes information on PCRC and the multi-nodal system of germplasm conservation in Canada as well as opportunities to search for germplasm on the Genetic Resources Information Network-Canadian version (GRIN-CA). Dr. Ken Richards, Research Manager, Plant Gene Resources of Canada, may be contacted at richardsk@agr.gc.ca.

Personnel of the Potato Gene Resources Repository Potato Research Centre

Richard Tarn - Potato Breeder
Agnes Murphy - Plant Pathologist
Trudy Dalton - Potato Breeding Technician
Jane Percy - Potato Gene Resources Technician
Donna Wilson - Plant Pathology Technician
Andrew Gardner - Supervisor
John MacDonald - Greenhouse Person
Danny Burnett - Greenhouse Person
Sylvia Holder - Greenhouse Person

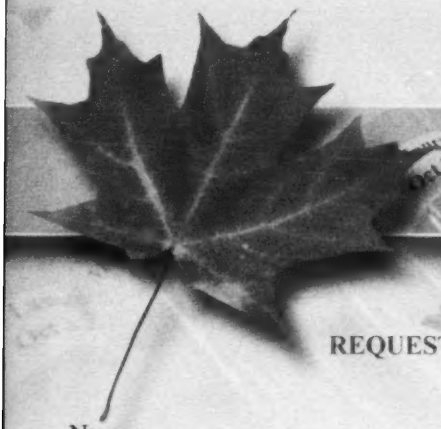
POTATO GENE RESOURCES REPOSITORY ACCESSIONS 2007 – 2008

Clones are available as *in vitro* plants or as tubers (*), as indicated
Two test tubes or two tubers (as available) of each clone are provided

ABNAKI*
AC BELMONT
AC BLUE PRIDE
AC BRADOR
AC CHALEUR
AC DOMINO
AC NOVACHIP
AC OUELLE†
AC POCAT†
AC RED ISLAND
AC SUNBURY
ACADIA RUSSET
ALL RED†
ANGELINA MAHONEY'S BLUE
ANSON
AVON
BANANA
BATOCHE
BEAUTY OF HEBRON
BELLEISLE
BLACK MIGNION/THE CUP
BLISS TRIUMPH
BLUE MAC
BLUE SHETLAND
BRIGUS
BRITISH COLUMBIA BLUE
CAIN'S IRISH ROCKS
CALICO
CANDY CANE
CANSO
CANUS
CARIBE
CARIBOO
CARLTON
CHEROKEE†
CHINOOK
CONESTOGA
CONGO
CORNE DE MOUTON
CROTTE D'OURS•
CUPIDS
DONNA
DORITA*
EARLAINE*
EARLY ROSE
EPICURE
ERAMOSA
F 58050
F 66041
F 79055
F 79070
F 87084
FINGERLING
FORTYFOLD
FUNDY
GARNET CHILI
GERMAN BUTTERBALL†
GOLD COIN
GRAND FALLS
GREEN MOUNTAIN*
HAIDA•
HOUMA
HINDENBURG*
HUNTER
HURON
IRISH COBBLER†
JEMSEG
JOGEVA YELLOW ESTONIAN
K113-1
KESWICK
KIFLI
LA VEINE ROSE/LA BELLE ROSE
LENAPE •
LIBERTAS
LRC 373-5
LRC 4373-5B
LUMPERS
MacINTOSH BLACK
MANOTA*
MARC WARSHAW'S QUEBEC
MCINTYRE BLUE
MIRTON PEARL
MRS. MOEHRLE'S YELLOW - FLESHED
MOURASKA
MYATT'S ASHLEAF
NIPIGON
NISKA
NRBK 01 to NRBK11
NORTHERN WHITE
NOVA SCOTIA BLUE
OAC ROYAL GOLD
OAC RUBY GOLD
OAC TEMAGAMI
PINK FIR APPLE
PINK PEARL
PURPLE CHIEF
PURPLE VIKING†
RAMBLING ROSE
RARITAN
RED GOLD
RED WARBA
RICHTER'S JUBEL
RIDEAU
RIVER JOHN BLUE
ROSE GOLD
ROYAL KIDNEY
RUBY PULSIVER'S BLUENOSER
RUSSET BURBANK*
SABLE
SAGINAW GOLD
SHARON'S BLUE
SHEPODY
SIBERIAN
SIMCOE
SKERRY BLUE
SLOVENIAN CRESCENT
STRAIGHT BANANA
TOBIQUE
TRENT
UP-TO-DATE
URGENTA*
USDA41956*•
USDA X96-56
WHITE ROSE
WHITE RURAL NEW YORKER*
YAM
YELLOW FIN
YORK•
YUKON GOLD

† New Accession 2007-2008
*Accessions available only as tubers
• Accessions with high TGA levels

Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada



Potato Gene Resources

POTATO RESEARCH CENTRE

REQUEST FOR POTATO GENE RESOURCES CLONES

Name: _____ Date: _____

Organization: _____

Mailing address:

_____ Postal Code Country _____

Shipping address:

_____ Postal Code Country _____

Telephone:
Fax:
E-Mail:

Personal information gathered on this form is used in order to respond to your request for tubers or plants. If you have any questions or concerns about your personal information, please call Jane Percy, Potato Gene Resources 506-452-3160.

Clones requested: (Please refer to available clones listed on reverse)
1.
2.
3.
4.
(Please list additional clones on a separate sheet).
Preferred date of receipt: (Please allow at least 5 weeks)
For our records, would you please state the intended use of the requested clones (research, breeding, evaluation, or specify another use)

□ Clone descriptions required?
□ Import permit attached if Phytosanitary Certificate required?
_____ Courier account number or alternate shipping arrangements

Please send this form to:

Potato Gene Resources Repository
Attention: Jane Percy
Agriculture and Agri-Food Canada
Potato Research Centre, P.O. Box 20280
Fredericton, New Brunswick Canada E3B 4Z7
E-Mail: percyj@agr.gc.ca Telephone: 506-452-3160 Facsimile: 506-452-3316